


**REMARKS****I. Priority**

Applicant thanks Examiner for acknowledgment of receipt of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in Belgium on March 3, 2004. The Office Action states that "Applicant has not complied with the requirements of 37 CFR 1.63(c) since the oath, declaration, or application data sheet does not acknowledge the filing of any foreign application." Applicant respectfully submits that the Application Data Sheet filed on May 5, 2006, Page 2, does in fact identify the foreign application and identifies the present application by application number and filing date. As shown below, the arrow indicates precisely that a Belgian foreign application was acknowledged.<sup>1</sup> Therefore, the applicant has complied with 37 CFR 1.63(c), and no further oath, declaration, or application data sheet is required.

**10/578256**  
**10/20/2006** **Rec'd PTO** **04 MAY 2006**

<p><b>Application Data Sheet</b></p> <p><b>Application Information</b></p> <p>Application Type:: Regular</p> <p>Subject Matter:: Utility</p> <p>Suggested Classification::</p> <p>Suggested Group Art Unit::</p> <p>CD-ROM or CD-R?: None</p> <p>Number of CD Disks::</p> <p>Number of Copies of CDs::</p> <p>Sequence Submission?:</p> <p>Computer Readable Form (CRF)?:</p> <p>Number of copies of CRF::</p> <p>Title:: SANDING ELEMENT</p> <p>Attorney Docket Number:: GILLES 2</p> <p>Request for Early Publication?: No</p> <p>Request for Non-Publication?: No</p> <p>Suggested Drawing Figure::</p> <p>Total Drawing Sheets:: 1</p> <p>Small Entity?: No</p> <p>Latin Name::</p> <p>Variety Denomination Name::</p> <p>Petition Included:: No</p> <p>Petition Type::</p> <p>Licensed US Govt. Agency::</p> <p>Contract or Grant Numbers::</p> <p>Secrecy Order in Parent Appl?: No</p> <p><b>Applicant Information</b></p> <p>Applicant Authority Type:: Inventor</p> <p>Primary Citizenship Country:: Belgium</p> <p>Status:: Full Capacity</p> <p>Given Name:: Dominique</p> <p>Middle Name::</p>		<p>Family Name:: GILLES</p> <p>Name Suffix::</p> <p>City of Residence:: Tildonk</p> <p>State or Province of Residence::</p> <p>Country of Residence:: Belgium</p> <p>Street of Mailing Address:: Deugenietastraat 5</p> <p>City of Mailing Address:: Tildonk</p> <p>State or Province of Mailing Address::</p> <p>Country of Mailing Address:: Belgium</p> <p>Postal or Zip Code of Mailing Address:: B-3150</p> <p><b>Correspondence Information</b></p> <p>Correspondence Customer Number:: 001444</p> <p><b>Representative Information</b></p> <p>Representative Customer Number:: 001444</p> <p><b>Domestic Priority Information</b></p> <table border="0"> <tr> <td>Application::</td> <td>Continuity Type::</td> <td>Parent</td> <td>Parent Filing</td> </tr> <tr> <td></td> <td></td> <td>Application::</td> <td>Date::</td> </tr> <tr> <td>This Application</td> <td>National Stage of</td> <td>PCT/805/050799</td> <td>03-03-05</td> </tr> </table> <p><b>Foreign Priority Information</b></p> <table border="0"> <tr> <td>Country::</td> <td>Application Number::</td> <td>Filing Date::</td> <td>Priority Claimed::</td> </tr> <tr> <td>Belgium</td> <td>2004/0116</td> <td>03-03-04</td> <td>Yes</td> </tr> </table> <p><b>Assignment Information</b></p> <p>Assignee Name:: CIBO N.V.</p> <p>Street of Mailing Address:: Deugenietastraat 5</p> <p>City of Mailing Address:: Tildonk</p> <p>State or Province of Mailing Address::</p> <p>Country of Mailing Address:: Belgium</p> <p>Postal or Zip Code of Mailing Address:: B-3150</p>	Application::	Continuity Type::	Parent	Parent Filing			Application::	Date::	This Application	National Stage of	PCT/805/050799	03-03-05	Country::	Application Number::	Filing Date::	Priority Claimed::	Belgium	2004/0116	03-03-04	Yes
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<sup>1</sup> Application Data Sheet, May 4, 2006. 1-2.

## **II. SPECIFICATION ARRANGEMENT**

A substitute specification is submitted herewith under 37 CFR 1.77(b). Marked copy begins on page 11, *infra*. No new matter is added.

## **III. CLAIM OBJECTIONS UNDER 608.01(n)**

Claims 1-11 are pending in the application. Claims 4-11 were objected to under 37 CFR 1.75(c) as being in improper form. Amendments to the claims are submitted to comply with 608.01(n). Applicant therefore respectfully requests examination of claims 4-11 on the merits to be fully responsive to the form paragraph used in the claim objection, although it appears claims 4-11 were already examined on the merits, as discussed below.

## **IV. CLAIM REJECTIONS UNDER 35 U.S.C. 102(b)**

Claims 1-11 were rejected under 35 USC 102(b) as unpatentable over Teetzel, et al, USPN 4,275,529 (herein referred to as "Teetzel"). Applicant respectfully traverses the rejection.

### **A. CLAIM 1**

Claim 1 recites in part a "compressible lamella." Teetzel does not teach compressible lamella, but rather teaches flaps which are pushed together in a condensed form and do not work by compressing like the lamella of claim 1. Flaps are far different since they form a wheel, and the outer rim of the wheel sands a workpiece. As disclosed in the present application, lamellas are unlike flaps since lamellas use a larger dimension of surface area that is not its outer edge. These differences are further explained below.

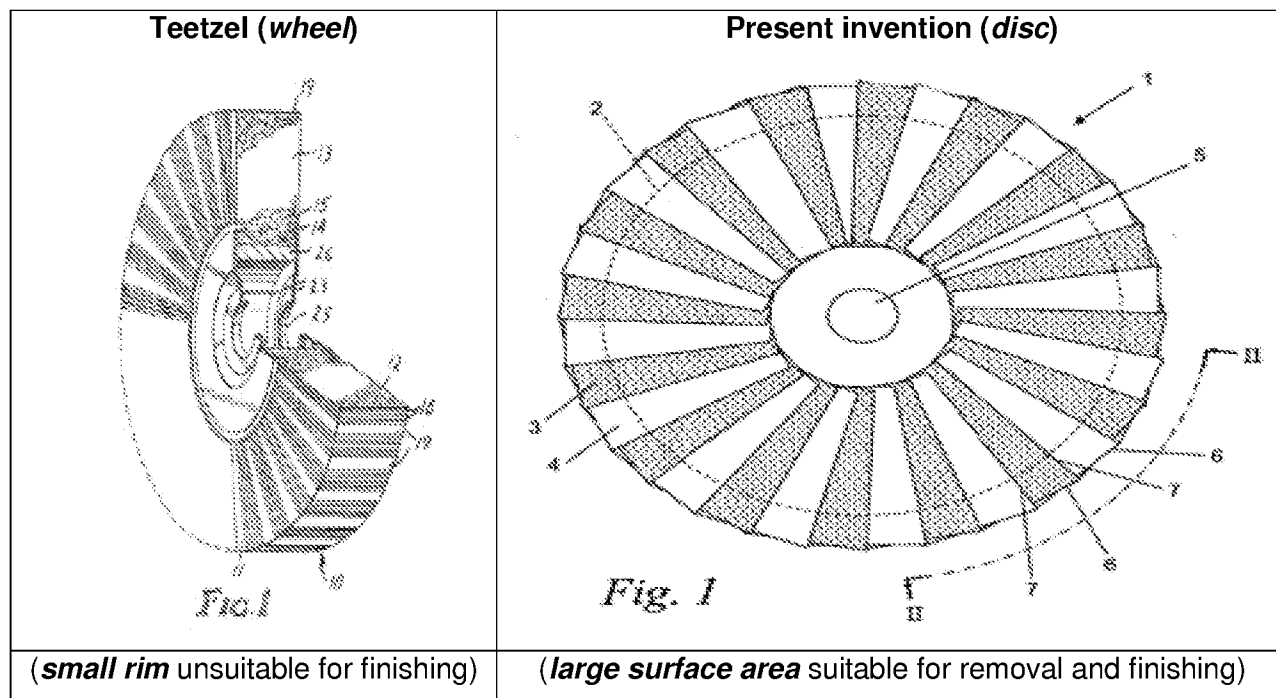
**1. NO TEACHING OF COMPRESSIBILITY.** Further, there is no teaching of compressibility of the lamellas in Teetzel. Claim 1's compressible lamellas are not pushed together as the high-density flaps of Teetzel and do not function in the same manner. In particular, the compressible lamellas of claim 1, when pressed against a workpiece, vary the amount of force applied to the workpiece which achieves constant pressure. The compressible aspect of the present invention is not taught by Teetzel. Therefore, claim 1 is not anticipated and is allowable.

**2. FLAPS ARE NOT LAMELLAS.** In addition, Teetzel teaches a wheel with flanged flaps adhesively fastened together at adjacent inner ends. The flaps form a wheel. However, claim 1 recites lamellas, not flaps on a wheel. Therefore, claim 1 is not anticipated and allowable.

**3. TEETZEL LACKS EXPOSED SURFACES.** Claim 1 also recites in part “sanding lamella.” Inherent are short side 6 and long side 7 of the lamella (Fig. 1). Long side 7 and short side 6 are exposed to provide the operational surface of each of the lamellas, as shown in Fig. 1. Teetzel lacks any such teaching. Therefore, claim 1 is not anticipated, and allowable.

**4. CONSISTENCY OF PRESSURE OVER TIME.** Another problem with the high density flaps of Teetzel is that the grain efficiency changes dramatically as the flap wheel is used and worn down. Flaps work much differently than lamellas in this respect as well. For example, the sanding and compressible lamellas of claim 1 are far more consistent as applied to a workpiece. Teetzel teaches flaps on a wheel which have inconsistent grain efficiency over time. In this regard, Teetzel does not teach lamellas. Therefore, claim 1 is not anticipated and allowable.

**5. SURFACE AREA DISTINGUISHED.** Teetzel teaches increased “grain efficiency” by using compressed flaps that do not provide surface area in the manner provided by the present invention. See Exhibit A, below. There is a significant difference in surface area which is to be applied to a workpiece. Teetzel does not teach such surface areas like the lamellas of claim 1. Therefore, claim 1 is not anticipated and allowable.



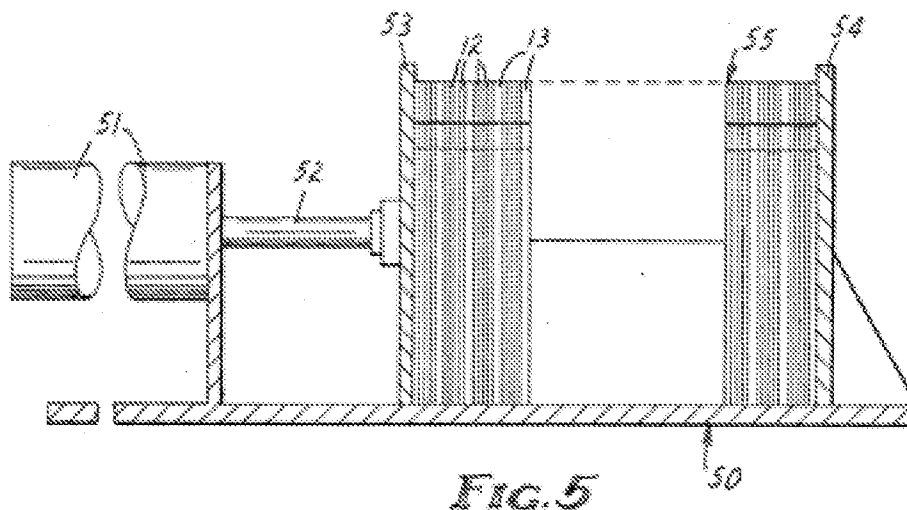
**Exhibit A. Disc of the present invention and wheel of the prior art**

**6. FINISHING VS. REMOVAL AND FINISHING DISTINCTION.** The compressible lamella of claim 1 facilitates both (i) removal of material from a workpiece; and (ii) finishing of the surface a workpiece to provide a smooth surface – in a single step. This can be accomplished by a novice since it does not require great skill to use. Teetzel's wheel, however, does not possess lamella and does not teach both removal and finishing in a single step. Teetzel's high density wheel does not “give” when it contacts a workpiece, unlike like the compressible lamella of claim 1. This makes Teetzel's high-density flap wheel even more unsuitable for finishing. Furthermore, Teetzel's wheel does not make it as easy to finish a workpiece, because the rim of the wheel provides a smaller area for sanding. Although Teetzel teaches efficient removal, it is very difficult to achieve a smooth finish using Teetzel's wheel when compared to the present invention. Teetzel does not teach finishing and removal with compressible lamella since its high-density flaps are not as suited to both removal and finishing. Therefore, claim 1 is not anticipated and allowable.

**7. HIGH-DENSITY FLAPS INFLICT HARD CONTACT, NOT THE CONSTANT PRESSURE OF COMPRESSIBLE LAMELLAS.** Moreover, Teetzel's wheel inflicts hard contact with a workpiece due to its high density. The compressible lamella of claim 1 avoids the hard contact by its compressibility. As noted in paragraph 004 of the specification, “the existing sanding elements are disadvantageous in that they get into a relatively hard contact with the surface of a workpiece to be treated, such that it is difficult to exert a constant pressure between the workpiece and the sanding element.” A highly compacted wheel creates hard contact, not soft contact that allows for constant pressure. Thus, claim 1 is not anticipated and allowable.

**8. USE OVER TIME DISTINGUISHED.** Furthermore, the change in constant pressure and grain efficiency can be distinguished as Teetzel's wheel and the present invention are used over time with a workpiece. For example, as Teetzel's high-density flap wheel is applied to a workpiece, its usable surface area—the rim of the wheel—is reduced and changes in efficiency. In contrast, the compressible lamella of claim 1 facilitates consistent pressure on the surface of a workpiece that does not vary so greatly in overall shape as it is used to sand a workpiece. This greatly facilitates consistent surface pressure, which is not taught by Teetzel. The constant pressure is facilitated by compressible lamellas and sanding lamellas of the present invention. The flaps of Teetzel's wheel do not apply constant pressure in the same manner as the

present invention. Thus, Teetzel does not teach constant pressure with its flaps as the compressible lamella of claim 1. Therefore, claim 1 is not anticipated and allowable.



**Exhibit B. Block form of high-density compressed flaps**

**9. NOT FORMED BY A BLOCK.** Now referring to Exhibit B, shown above, Claim 1 lamellas are not formed in the shape of a block as taught by Teetzel. Forming the lamellas in a high-density block or wheel would change the compressible lamellas into a compressed form, which would eliminate the consistent abrasive force imparted by the compressible lamella of the present invention. Further, it is impossible to form the compressible lamellas of Claim 1 by the teachings of Teetzel. In particular, the flaps, which are already compressed as in Teetzel, affect the consistency of sanding force applied to a workpiece that is advantageous in the present invention. Therefore, Claim 1 is not anticipated and thus allowable.

**10. WHEEL IS NON-ANALOGOUS.** Further, Teetzel discloses a wheel with flaps perpendicular to the plane of the wheel. Applicant's invention is directed to a laminated disc, not a wheel. The wheel is non-analogous to the laminated disc of the present invention. A significant benefit of applicant's invention is disc surface grinding applications. Since the lamella of Claim 1 are implicitly positioned at an angle (see Fig. 2), more work is achieved in a shorter time than by the rim of an abrasive wheel. Therefore, Claim 1 is not anticipated and thus allowable.

**11. RELATIVELY UNSKILLED USER CAN REMOVE AND FINISH.** Another distinction of the present invention is that both removal and finishing steps can be

accomplished in a single step, by an unskilled user. Teetzel teaches a very narrow working area when compared to the surface area of the present invention. Teetzel does not enable wide area finishing through use of its wheel. In this regard, the lamellas of Claim 1 are not taught by Teetzel. Thus, Claim 1 is not anticipated and allowable.

**CONCLUSION: Claim 1**

For the above reasons, we respectfully submit that Claim 1 is not anticipated and is therefore allowable. Accordingly, dependent claims 2-11 are also not anticipated under 102(b) and allowable.

**B. CLAIM 2**

Claim 2 was rejected under 102(b) over Teetzel. Claim 2 recites in part "...said sanding lamellas (3) and/or compressible lamellas (4) are composed of several lamellas of the type concerned." For the same reasons discussed above, Teetzel does not teach the lamellas of claim 2. Thus, claim 2 is not anticipated and is allowable.

**C. CLAIM 3**

Claim 3 was rejected under 102(b) over Teetzel. Claim 3 recites in part, "...said compressible lamellas (4) are elastically compressible." As above, compressible lamellas are not taught by Teetzel. The teachings of Teetzel are flaps, not lamellas, and are compressed, not compressible. Furthermore, elastically compressible lamellas are not taught by Teetzel. Teetzel is not elastic.

**D. CLAIMS 4-11**

Since the Office Action dated March 24, 2009 mentions elements in the claims 4-11, it appears that claims 4-11 were indeed examined on the merits, applicant also traverses the rejection, with the following remarks:

Claim 4 recites an "open structure." The lamellas are exposed in an open structure with short side 6 and long side 7 being exposed, unlike Teetzel's closed wheel where the flaps are uniformly placed in a wheel formed by a block. Every flap of Teetzel overlaps. The flaps are completely closed, and the "root" of Teetzel with flanged portions are clearly not suited to an open structure. The Teetzel reference uses the word "opening" in reference to a central hole in

the middle of the wheel. Nothing in Teetzel discloses an open structure. Therefore, claim 4 is not anticipated. Thus, claim 4 is allowable as are dependent claims 5-11.

Claim 5 recites "...said compressible lamellas (4) contain non-woven fibres (10), more particularly non-woven synthetic fibres (10). The Office Action mentions "non-woven" as being disclosed by Teetzel. It is critical to note exactly what object the term "non-woven" refers. Non-woven flaps disclosed by Teetzel are not non-woven fibres in a compressible lamella. Therefore, claim 5 is not anticipated and allowable.

Claim 6 recites "...sanding grains (9) provided on said fibres (10)." Although Teetzel discloses coated abrasive flaps in passing, Teetzel does not teach grains being provided on the fibres specifically. Having coated flaps does not lead one of ordinary skill to place sanding grains on fibres. Teetzel assumes that the grains are provided by coated abrasive flaps, without any mention of sanding grains provided on fibres. Clearly, the flaps of Teetzel are not the fibres of the present invention. Sanding grains on the flaps are not the same as sanding grains on said fibres of the present invention. Therefore, claim 6 is not anticipated and allowable.

Claim 7 recites "...said fibres (10) which are joined together by means of a synthetic resin and thus form a three-dimensional open structure." Although Teetzel discloses certain resins to secure abrasive grains to backing (Teetzel at 5:5), Teetzel does not teach joining fibres together via synthetic resin. Fibres (10) of the present invention are not backing. Fig. 3 provides a non-limiting example. Moreover, Teetzel presupposes conventional coated abrasives. Teetzel makes no mention of binding fibres together, let alone to form a three-dimensional structure. Teetzel teaches that the flaps are compacted (Teetzel at Figs. 5-7) to make the high density wheel efficient, which makes Teetzel's flaps "closed," not "open" in the broadest sense. Claims are to be interpreted in their broadest reasonable interpretation during prosecution. The broadest interpretation would not include a closed flap structure as taught by Teetzel. Thus, claim 7 is not anticipated and allowable.

Claim 8 recites "...sanding grains (9) adhere to said fibres (10) by means of the above-mentioned synthetic resin." Teetzel discloses resin to hold flaps at inner ends of the tube of the wheel, along with flanged flaps. However, Teetzel does not teach use of resin to adhere sanding grains (9) to the fibres (10). Thus, claim 8 is not anticipated and is allowable.

Claim 9 recites "...said sanding lamellas (3) are formed of abrasive cloth." Teetzel does not teach abrasive cloth to form sanding lamellas, only flaps. Therefore, claim 9 is not anticipated and allowable.

Claim 10 recites compressible lamellas having a thickness of at least three times the thickness of the sanding lamellas. In the wheel taught by Teetzel, the outside diameter is much greater than the inside diameter. There is more space between the flaps on the outside of the wheel than the inside of the wheel. The inner ends of the flaps taught by Teetzel are much more compressed, being less than 35% of the thickness than the outside of the block. Teetzel at 4:23. Therefore, the thickness is not the same. Therefore, claim 10 is not anticipated and allowable.

Claim 11 is directed to a disc ("round, disc-shaped support"). Teetzel teaches a high density wheel. The wheel has minimal abrasive capabilities. Applicant's invention is directed to a disc, not a wheel. Abrasive wheels such as that taught by Teetzel require contact on the outer rim of the wheel. Wheels are typically used as a finishing technique in abrasive practice. Applicant's invention is capable of both removing material as well as finishing, in a single step. Teetzel's high density wheel limits the area of sanding, because the flaps are formed in a wheel shape. Therefore, a workpiece sanded by the Teetzel wheel only contacts the flap at the outer rim. In contrast, the disc-shaped support of the present invention provides significantly more abrasive surface area which can be applied to a workpiece far more efficiently, due to the significantly higher surface area of the disc. Because of the significant difference in application and sanding surface available, the wheel and the disc are not the same. Therefore, claim 11 is not anticipated and allowable.



## **SUBSTITUTE SPECIFICATION**

### **SANDING ELEMENT**

#### **BACKGROUND OF THE INVENTION**

##### **1. Field of the Invention.**

[0001] The present invention concerns a sanding element with a succession of overlapping lamellas containing sanding grains.

[0002] Such sanding elements are made in the form of what is called a laminated disc, whereby successive lamellas are arranged according to the peripheral direction of the disc and overlap. These sanding elements are used for example for sanding [[en]] and finishing, more particularly for polishing welds on metal workpieces.

##### **2. Description of Related Art.**

[0003] American patent US 6 582 289 describes a laminated disc with a succession of overlapping lamellas. These lamellas are alternately formed of abrasive cloth containing sanding grains and lamellas provided with an active sanding layer. Such an active sanding layer contains no sanding grains, provides mainly for the removal of removed material and reduces the heating of the workpiece to be sanded.

[0004] However, the existing sanding elements are disadvantageous in that they get into a relatively hard contact with the surface of a workpiece to be treated, such that it is difficult to exert a constant pressure between the workpiece and the sanding element. Moreover, the existing sanding elements have a relatively short life and, after a metal surface has been sanded with such an aggressive sanding element, this surface must be further treated with what is called a finishing disc in order to obtain a smooth and aesthetically acceptable surface.

#### **SUMMARY OF THE INVENTION**

[0005] The invention aims to remedy these disadvantages by providing a sanding element with a much longer life than the present sanding elements, while it allows [[to]] for finishing a workpiece almost to perfection in a very fast manner, as a result of which the use of two different discs is no longer necessary. The sanding element according to the invention makes it possible to remove material from the workpiece as well as to perfectly finish the workpiece, both with from an aesthetic and a technical point of view. More particularly, with the

sanding element according to the invention, very low roughness values up to 3 Ra/cm<sup>2</sup> of the surface of a workpiece can be obtained in a single step.

[0006] To this aim, said lamellas are alternately formed of sanding lamellas and compressible lamellas, such that every sanding lamella rests on a compressible lamella.

[0007] Practically, these compressible lamellas are elastically compressible.

[0008] In an advantageous manner, said compressible lamellas contain non-woven fibres, more particularly non-woven synthetic fibres.

[0009] According to a preferred embodiment of the sanding element according to the invention, sanding grains are provided on said fibres.

[0010] According to an interesting embodiment of the sanding element according to the invention, said fibres are joined together by means of gluing, for example by means of a synthetic resin, and thus have a three-dimensional open fibre structure.

[0011] Preferably, said lamellas are fixed on a round, disc-shaped support, whereby the free edges of these lamellas extend practically radially, such that the sanding element forms what is called a laminated disc.

[0012] Other particularities and advantages of the sanding element according to the invention will become clear from the following description of a few special embodiments of the invention; this description is given as an example only and does not restrict the scope of the claimed protection in any way; the figures of reference used hereafter refer to the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Figure 1 is a schematic view from above of the sanding element according to the invention.

[0014] Figure 2 is a schematic side-view according to line II-II of the sanding element from Figure 1.

[0015] Figure 3 is a schematic cross-section to a larger scale of a compressible lamella according to the invention, represented in greater detail.

[0016] Figure 4 schematically represents a view from above of two pipes which are welded together at an angle of 90°.

#### DETAILED DESCRIPTION OF THE DRAWINGS

[0017] In the different drawings, identical figures of reference refer to the same elements.

[0018] The invention generally concerns a sanding element, more particularly a laminated disc, which contains successive overlapping lamellas. These lamellas are alternately formed of sanding lamellas, whose outer surface or free surface is provided with sanding grains, and compressible lamellas upon which the sanding lamellas rest.

[0019] Figure 1 represents such a sanding element in the form of a laminated disc 1. The latter contains an almost non-deformable round, disc-shaped support 2 on which a sanding lamella 3 and compressible lamella 4 are alternately fixed, in such a manner that each lamella 4 overlaps with a sanding lamella 3. The sanding lamella 3 here each time rests with its operational part on a corresponding compressible lamella 4.

[0020] Said support 2 has a central opening 5 via which the laminated disc 1 can be mounted on a drive in a manner known as such. This drive, which is not represented in the figures, makes it possible to rotate the laminated disc 1 at high speed around its axis, whereas the disc 1 is pressed against the workpiece, such that the lamellas 3 and 4 make contact with the surface of said workpiece to be finished.

[0021] The disc according to the invention hereby makes an even contact with the surface of the workpiece with an almost uniform pressure, thanks to the compressibility of the lamellas 4.

[0022] The sanding lamellas 3 are formed for example of a cotton or polyester textile fabric onto which are fixed sanding grains by means of a bonding layer. Thus such lamellas are formed for example of abrasive cloth. However, these lamellas may also be formed of a paper, a polyester or a mixed support such as polyester cotton onto which are provided sanding grains.

[0023] The compressible lamellas 4 mainly consist of fibres 10. More particularly, these compressible lamellas 4 are formed of non-woven synthetic fibres 10 which are joined together by means of a synthetic resin and thus have a three-dimensional open fibre structure. This fibre structure is glued onto a woven base 11, or adhered thereto in another manner.

[0024] Further, sanding grains 9 are provided on the fibres 10 via this synthetic resin. In order to make sure that, when using the laminated disc 1, the fibres 10 will stick to each other, irrespective of the heat that is produced while sanding, a thermosetting synthetic resin is preferably used as said synthetic resin. The synthetic fibres 10 are formed for example of polyamide yarns having a diameter between 0.75 and 0.85 mm.

[0025] Thus, these compressible lamellas 4 form an open three-dimensional structure which is elastically deformable. The fibres 10 extend in this structure in an almost disorderly manner. Figure 3 represents a cross-section of such a compressible lamella 4.

[0026] As the lamellas 3 and 4 overlap, each sanding lamella 3 is at least partly supported by a compressible lamella 4. When the laminated disc 1 thus makes contact with the surface of the workpiece of a workpiece to be finished, a practically homogenous pressure will be exerted in the contact surface between said workpiece and the laminated workpiece 1, as already mentioned above.

[0027] In order to make sure that a relatively soft contact is made between the surface of the workpiece and the laminated disc 1, the thickness of the compressible lamellas 4 is preferably at least equal to three times the thickness of said sanding lamellas 3.

[0028] According to an interesting embodiment of the sanding element according to the invention, the thickness of the sanding lamellas 3 is almost 0.5 mm to 1 mm, whereas the thickness of the compressible lamellas 4 is for example in the order of magnitude of 3 to 8 mm. Every lamella 3 and 4 forms a rectangle with a short side 6 having a length of almost 20 mm and a long side 7 of some 30 mm. The long side 7 of the top side of the lamellas 3 and 4, or in other words the free edge thereof, extends practically radially onto the support 2, whereas the short side 6 is situated in a tangent plane on the circumference of the lamellas.

[0029] The lamellas 3 and 4 overlap in the direction of their short side 6, over a distance which is practically equal to  $\frac{2}{3}$  to  $\frac{5}{6}$  of the length of this short side 6. The lamellas 3 and 4 preferably overlap over a distance of  $\frac{3}{4}$  of the length of short side 6.

[0030] The lamellas 3 and 4 are fixed tightly to said support by means of a layer of glue 8.

[0031] The laminated disc 1 according to the invention is particularly interesting when it is used to remove a surface layer on metal surfaces.

[0032] Figure 4 schematically represents a workpiece consisting of two pipes 12 and 13 made of stainless steel with a diameter of 40 mm which are welded together at right angles. The formed weld 14 extends at an angle of  $45^\circ$  in relation to the axis of the pipes 12 and 13.

[0033] According to the state of the art, after sanding with a conventional aggressive sanding instrument such as a fibre disc, a lamella sanding disc, a trimming disc, etc., such a weld 14 of a workpiece is smoothened by a means of what is called a conventional finishing disc, which mainly has a three-dimensional open fibre structure in which are provided sanding grains.

[0034] In some cases, it is possible to sand and finish the workpiece in a single step with one and the same finishing disc. In that case, the finishing disc will be entirely worn after smoothening the surface of five workpieces. When the same finishing process is carried out by means of the laminated disc 1 according to the invention, it is found that one and the same disc can treat sixteen of such workpieces before the disc has work out.

[0035] Moreover, it was found that in order to smooth 25 welded joints by means of said conventional finishing disc, a processing time of 41 minutes and 36 seconds was required. When 25 identical welded joints are smoothened by means of the laminated disc according to the invention, only 23 minutes and 52 seconds are required.

[0036] Thus, on the bases of these tests it was found that, with the laminated disc according to the invention, one can work almost twice as fast as with a conventional finishing disc. Further it turned out that the life of the laminated disc according to the invention is more than three times the life of a conventional finishing disc.

[0037] The sanding lamellas and the compressible lamellas may contain all sorts of sanding grains, such as for example ceramic sanding grains or aluminum oxide grains, zirconium oxide grains, silicon carbide or an agglomerate of these grains. Very good results were obtained with what are called structured sanding grains which are described for example in European patent EP 1 011 924 and which are provided for example according to a regular pattern and with a specific orientation on the lamellas of the sanding element. Such structured grains are formed for example of conventional sanding grains whose surface is coated with what are called functional powders, such as very fine sanding grains, anti-static additives, lubricants, etc.

[0038] Further, the sanding lamellas 3 and/or the compressible lamellas 4 may be composed of several lamellas of the same type. Thus, it is also possible that the sanding element contains a succession of overlapping groups of lamellas, whereby these groups are alternately formed of at least one sanding lamella 3 and at least one compressible lamella 4. Each group of sanding lamellas 3 hereby rests on a group of compressible lamellas 4. This implies among others that a group of sanding lamellas containing for example two or more sanding lamellas 3 can rest on only one compressible lamella 4 or that for example each sanding lamella 3 can rest on a group of compressible lamellas 4. The lamellas of each group of lamellas preferably overlap.

[0039] Naturally, the invention is not restricted to the above-described embodiment of the sanding element according to the invention. Thus, for example the lamellas

3 and 4 must not necessarily be fixed onto a disc-shaped support, but they can also be fixed for example onto a closed belt.

[0040] The sanding element according to the invention cannot only be applied to finish welded joints made of stainless steel, but it can also be used to improve the surface roughness in general of any material whatsoever, such as for example, iron alloys, ferrous and non-ferrous alloys, stone, plastics, etc.

Abstract of the Disclosure

The invention concerns a sanding element with a succession of overlapping lamellas (3, 4) containing sanding grains (9), characterized in that these lamellas (3, 4) are alternately formed of sanding lamellas (3) and compressible lamellas (4), whereby each sanding lamella (3) rests on a compressible lamella (4).